

APPENDIX H

LARGE MAMMAL MOVEMENT PLAN/RIPARIAN AND AQUATIC SPECIES HABITAT EVALUATION



REPORTS FOR

RANCHO LAS LOMAS
19191 LAWRENCE CANYON
SILVERADO, CA 92676

**RANCHO LAS LOMAS LARGE MAMMAL MOVEMENT
EVALUATION**

**RIPARIAN AND AQUATIC SPECIES HABITAT
EVALUATION AT RANCHO LAS LOMAS**

JUNE 21, 2004

REPORT FOR

**RANCHO LAS LOMAS
19191 LAWRENCE CANYON
SILVERADO, CA 92676**

**RANCHO LAS LOMAS LARGE MAMMAL MOVEMENT
EVALUATION**

JUNE 21, 2004

Rancho Las Lomas Large Mammal Movement Evaluation

Steve A. Loe, Certified Wildlife Biologist

June 21, 2004

Summary: Large mammal movement in the Upper Aliso Canyon Watershed above Cook's Corner has been severely impacted by roads and numerous developments. Existing residents and their structures in the extreme upper end of Aliso Creek all the way down to Cook's Corner have encroached upon the stream for many years.

As part of the permitting process, Rancho Las Lomas is opening up the stream bottom of Aliso Creek to allow more natural flows where it is currently restricted by culverts. Culverts are being replaced with bridges. This will improve the opportunity for animal movement up and down the stream bottom. However, this area is probably only used by skunks to any extent. The stream bottom is too restricted by human uses and activities on this and adjacent properties to be of much value to larger mammals. The property owner immediately upstream of Rancho Las Lomas has created an in-stream temporary wood structure that currently impedes even small animal movement in the stream bottom.

The only additional modification to the Rancho Las Lomas property that has potential to substantially improve the situation for larger mammal movement would be to eliminate the barrier created by the perimeter fencing on the south side of the property on the slope above the stream. This area would only achieve its full potential as a movement corridor if the adjacent landowner to the west of Rancho Las Lomas would modify similar fencing along Ridgeline Road.

Background: Original property owners in the Upper Aliso Watershed constructed their residences in the bottom of the canyon just outside the floodplain. There are at least 5 of these residences (including the Leavitts Horse Training Facility in the extreme upper end of Aliso Creek and Rancho Las Lomas) still surrounding Aliso Creek between the headwaters and Cook's Corner. In the past, larger mammals were able to move up and down the drainage by going around these dwellings and using the upland benches above the drainage.

As the canyon has continued to develop over the years, these benches and the ridges above the drainage have also been impacted. Roads (and their associated traffic) such as Santiago Canyon Rd., Live Oak Canyon Rd., and El Toro Rd. have made animal movement on the traversed benches and ridges extremely dangerous. Developments (such as Portola Hills, Santiago Canyon Estates, Hidden Ridge and Saddleback Meadows) have further constrained the ability of animals to move through the watershed.

Aliso Creek through the Rancho Las Lomas property has been encroached upon for many years by existing residences and other buildings and facilities. This was not much of a problem before the great increase in road traffic on Santiago Canyon Rd. and the buildout of surrounding housing developments because the animals could go around the developed portions of the riparian corridor. Larger mammal movement up and down Aliso Creek above Cook's Corner is now almost non-existent. Some larger mammals such as coyotes, bobcat and mountain lion (especially dispersing young) probably attempt to move along Santiago Canyon road and its shoulders. However, the probability of road kill in this area is great.

Current Situation: The property and surrounding properties were surveyed on October 20, 2003 and May 22, 2004. In addition, residents and employees were interviewed regarding wild animal use and history of the property.

Now that the Rancho Las Lomas Facility has been improved for some years, Santiago Canyon Road has become so heavily traveled, and adjacent developments have been constructed, there are few options for medium and large mammal (deer, mountain lion, bobcat, coyote, fox, etc.) movement up and down the upper watershed. The best opportunity for movement through the Rancho Las Lomas property is currently the south half of the property on the undeveloped north-facing slope as shown on the attached Exhibit A.

Small nocturnal mammals (such as skunks) may still occasionally use the drainage through the developed area of the property. The drainage on Rancho Las Lomas is not fenced to allow free movement of water. It is planned to be opened up even more with the improvement of the stream crossings as recommended by Fish and Game. Even though the drainage will be improved for wildlife movement, it is still not very desirable. The adjacent landowner upstream of the property has built a wooden in-stream structure that currently restricts movement up and down the stream. The

understory on the Ranch is predominately non-native periwinkle and does not provide much cover for large mammals. In addition, there is significant human activity on both sides of the stream. With all the human activity and penned animals adjacent to the stream, it is not an area that one would really want to have large mammal movement.

The undeveloped upper half of the property is much more desirable for animal movement for several reasons. There is still a somewhat natural understory for cover and large and small animals moving through this area would not be in conflict with humans and penned animals as they would be in the developed area.

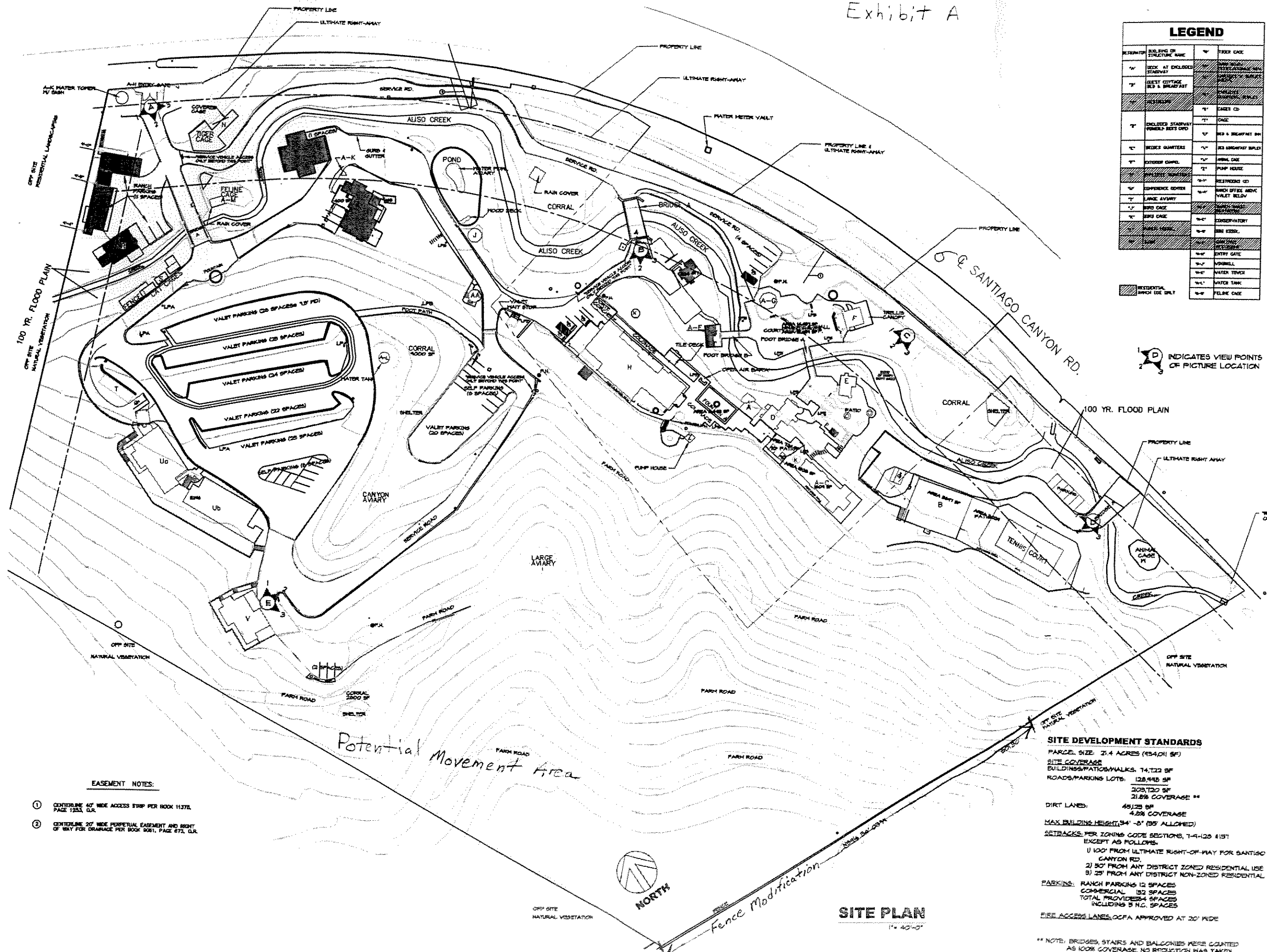
Medium and larger mammals are moving up to the fencing on the ranch property on the south side above Aliso Creek, and they are also moving down the watershed to the fencing on the east side of Ridgeline road. Movement beyond these points through Rancho Las Lomas and the adjacent property to the west is restricted by a three foot high, six inch wire mesh fence, topped with 3 foot of barbed wire. This six foot fence surrounds the ranch property on the, south side. A heavily used wildlife trail coming up the canyon was found to skirt the fence on the south end and funnel animals into the condominiums south and west of the property due to the barrier it creates.

Providing for wildlife movement within the watershed is still important. There is substantial large and medium sized mammal habitat available upstream and downstream of Rancho Las Lomas and its value would be greatly increased if these habitat areas were linked through the ranch and the adjacent property to the west.

Recommendations: I suggest that the south perimeter fencing from the condominiums down to the edge of the developed area above Aliso Creek (Exhibit A) be modified to provide for mammal movement and yet provide some security from human trespass. Ideally, the fencing should be less than 42 inches total height. I recommend three strand wire fence with the bottom wire smooth and 20 inches above the ground. The next two barbed wires should be 10 and 12 inches apart. Modifying this fencing would improve the wildlife movement situation and reduce the impacts of the Rancho Las Lomas development on large mammal movement. The full value of this fence modification can only be achieved by the adjacent landowner making similar modifications to the fence along Ridgeline Road. This would allow movement from open space in the lower watershed to the open space in the

upper watershed and make a substantial area of habitat available for larger mammals.

Exhibit A



LEGEND		
RESIDENTIAL	BUILDING OR STRUCTURE NAME	VIEW CASE
1"	DECK AT ENCLOSED STAIRWAY	VIEW BELOW STAIRWAY/STAIRWAY AREA
2"	GUEST COTTAGE BED & BREAKFAST	VIEW OF SUITCASE
3"	POOL	VIEW OF SUITCASE
4"	ENCLOSED STAIRWAY	VIEW OF SUITCASE
5"	BECK'S QUARTERS	VIEW OF SUITCASE
6"	OUTDOOR CHAPEL	VIEW OF SUITCASE
7"	ENCLOSED STAIRWAY VIEWED - BED'S CASE	VIEW OF SUITCASE
8"	BECK'S QUARTERS	VIEW OF SUITCASE
9"	OUTDOOR CHAPEL	VIEW OF SUITCASE
10"	ENCLOSED STAIRWAY	VIEW OF SUITCASE
11"	BECK'S QUARTERS	VIEW OF SUITCASE
12"	OUTDOOR CHAPEL	VIEW OF SUITCASE
13"	ENCLOSED STAIRWAY	VIEW OF SUITCASE
14"	BECK'S QUARTERS	VIEW OF SUITCASE
15"	OUTDOOR CHAPEL	VIEW OF SUITCASE
16"	ENCLOSED STAIRWAY	VIEW OF SUITCASE
17"	BECK'S QUARTERS	VIEW OF SUITCASE
18"	OUTDOOR CHAPEL	VIEW OF SUITCASE
19"	ENCLOSED STAIRWAY	VIEW OF SUITCASE
20"	BECK'S QUARTERS	VIEW OF SUITCASE
21"	OUTDOOR CHAPEL	VIEW OF SUITCASE
22"	ENCLOSED STAIRWAY	VIEW OF SUITCASE
23"	BECK'S QUARTERS	VIEW OF SUITCASE
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60"	OUTDOOR CHAPEL	VIEW OF SUITCASE
61"	ENCLOSED STAIRWAY	VIEW OF SUITCASE
62"	BECK'S QUARTERS	VIEW OF SUITCASE
63"	OUTDOOR CHAPEL	VIEW OF SUITCASE
64"	ENCLOSED STAIRWAY	VIEW OF SUITCASE
65"	BECK'S QUARTERS	VIEW OF SUITCASE
66"	OUTDOOR CHAPEL	VIEW OF SUITCASE
67"	ENCLOSED STAIRWAY	VIEW OF SUITCASE
68"	BECK'S QUARTERS	VIEW OF SUITCASE
69"	OUTDOOR CHAPEL	VIEW OF SUITCASE
70"	ENCLOSED STAIRWAY	VIEW OF SUITCASE
71"	BECK'S QUARTERS	VIEW OF SUITCASE
72"	OUTDOOR CHAPEL	VIEW OF SUITCASE
73"	ENCLOSED STAIRWAY	VIEW OF SUITCASE
74"	BECK'S QUARTERS	VIEW OF SUITCASE
75"	OUTDOOR CHAPEL	VIEW OF SUITCASE
76"	ENCLOSED STAIRWAY	VIEW OF SUITCASE
77"	BECK'S QUARTERS	VIEW OF SUITCASE
78"	OUTDOOR CHAPEL	VIEW OF SUITCASE
79"	ENCLOSED STAIRWAY	VIEW OF SUITCASE
80"	BECK'S QUARTERS	VIEW OF SUITCASE
81"	OUTDOOR CHAPEL	VIEW OF SUITCASE
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83"	BECK'S QUARTERS	VIEW OF SUITCASE
84"	OUTDOOR CHAPEL	VIEW OF SUITCASE
85"	ENCLOSED STAIRWAY	VIEW OF SUITCASE
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87"	OUTDOOR CHAPEL	VIEW OF SUITCASE
88"	ENCLOSED STAIRWAY	VIEW OF SUITCASE
89"	BECK'S QUARTERS	VIEW OF SUITCASE
90"	OUTDOOR CHAPEL	VIEW OF SUITCASE
91"	ENCLOSED STAIRWAY	VIEW OF SUITCASE
92"	BECK'S QUARTERS	VIEW OF SUITCASE
93"	OUTDOOR CHAPEL	VIEW OF SUITCASE
94"	ENCLOSED STAIRWAY	VIEW OF SUITCASE
95"	BECK'S QUARTERS	VIEW OF SUITCASE
96"	OUTDOOR CHAPEL	VIEW OF SUITCASE
97"	ENCLOSED STAIRWAY	VIEW OF SUITCASE
98"	BECK'S QUARTERS	VIEW OF SUITCASE
99"	OUTDOOR CHAPEL	VIEW OF SUITCASE
100"	ENCLOSED STAIRWAY	VIEW OF SUITCASE

INDICATES VIEW POINTS OF PICTURE LOCATION

EASEMENT NOTES:

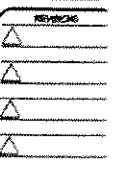
- 1) CENTERLINE 40' WIDE ACCESS STRIP PER BOOK 11376, PAGE 1233, G.L.R.
- 2) CENTERLINE 20' WIDE PERPETUAL EASEMENT AND RIGHT OF WAY FOR DRAINAGE PER BOOK 9061, PAGE 873, G.L.R.

SITE DEVELOPMENT STANDARDS
PARCEL SIZE: 21.4 ACRES (934,011 SF)
SITE COVERAGE: 21.4%
BUILDINGS/PATIO/WALKS: 14,122 SF
ROADS/PARKING LOTS: 128,948 SF
203,120 SF
21.8% COVERAGE **
DIRT LANE: 45,128 SF
4.8% COVERAGE
MAX BUILDING HEIGHT: 34' - 5" (35' ALLOWED)
SETBACKS: PER ZONING CODE SECTIONS 14-4-28 & 15-1-1
EXCEPT AS FOLLOWS:
1) 100' FROM ULTIMATE RIGHT-OF-WAY FOR SANTIAGO CANYON RD.
2) 50' FROM ANY DISTRICT ZONED RESIDENTIAL USE
3) 25' FROM ANY DISTRICT NON-ZONED RESIDENTIAL USE
PARKING: RANCH PARKING 12 SPACES
COMMERCIAL 132 SPACES
TOTAL PROVIDED 144 SPACES
INCLUDING 5 H.C. SPACES
FIRE ACCESS LANE: OCCA APPROVED AT 20' WIDE

** NOTE: BRIDGES, STAIRS AND BALCONIES WERE COUNTED AS 100% COVERAGE. NO REDUCTION WAS TAKEN

RANCHO LAS LOMAS
19191 LAWRENCE CANYON
CHULA VISTA, CA

SITE PLAN



SITE PLAN
1" = 40'-0"

REPORT FOR

***RANCHO LAS LOMAS
19191 LAWRENCE CANYON
SILVERADO, CA 92676***

**RIPARIAN AND AQUATIC SPECIES HABITAT
EVALUATION AT RANCHO LAS LOMAS**

JUNE 21, 2004

Riparian and Aquatic Species Habitat Evaluation at Rancho Las Lomas
Steve A. Loe, Certified Wildlife Biologist
June 21, 2004

Summary

Riparian and aquatic habitat at Rancho Las Lomas was surveyed on October 20, 2003 and May 22, 2004. The purpose of the survey was to determine if the habitat on site was suitable for Threatened, Endangered or other imperiled species. Habitat suitability was evaluated for least Bell's vireo, southwest willow flycatcher, arroyo toad, western pond turtle, and coast range newt. This project is within the range of these species and they could be present if adequate habitat were available. Based on the field surveys, the enclosed Species Accounts (Appendix A), and Habitat Suitability Criteria (Appendix B), there is not suitable habitat on the Rancho Las Lomas property for any of these species.

Description of the Habitat

The riparian habitat on the property is composed of large sycamore and oak with a 30-60 % canopy closure 30-70 ft. above the ground. The trees are very large and rather open branched. There are a few smaller trees and shrubs (largely non-native), but the 2-30 ft. zone is very open with less than 5 percent cover. The understory right up to the edge of the stream is almost entirely (95%) non-native periwinkle.

There is no permanent flow in Aliso Creek through the property. In October, no flow was observed and there was no indication of any seasonal pooling or moist soil. In May, there was evidence of flow coming into Aliso Creek from the storm drain originating in the large development across the highway. This runoff was traced to the many storm drains and streets of the development, and was coming primarily from yards being over-watered and people washing their vehicles and driveways. There was substantially more water early in the day and it virtually stopped later in the day. At its peak, it was soaking into the stream bottom approximately 200 feet downstream of the storm drain outlet in Alliso Creek. The water was of poor quality as evidenced by a dark color, film of oil and amount of trash that was being transported from the development. There was no indication that this stretch of stream remained wet except during watering of the adjacent development since there was no algal mats or aquatic invertebrates present.

The open stream bottom is 2-3 ft. wide and comprised of 90% boulders and cobbles with sand and gravel intermixed. The banks through the property are very steep and have dense non-native periwinkle totally occupying the understory. The streambank and upland soils are fairly compact and not sandy. The stream gradient is 3% through the property. The upland, outside of the 100-year floodplain, is highly disturbed with driveways, walkways animal cages, outdoor courts, and periwinkle.

The habitat is subject to considerable human use and disturbance from pets and other non-native animals kept in pens and cages on the property.

Suitability for Least Bell's vireo

The habitat was not suitable for least Bell's vireo. There were adequate overstory trees, but there were virtually no understory shrubs for nesting. The few shrubs and small trees that did provide some cover in the 2-10 ft. zone, were mostly non-native plants and had a cover of less than 5%. There were no native willows or mulefat, and no clumps of dense shrubs. The understory was solid periwinkle. Gradient was 3%.

Suitability for Southwest Willow Flycatcher

The habitat was not suitable for southwest willow flycatcher. Nowhere was there dense foliage that would be suitable for nesting. This was especially true in the 0-30 ft. zone. Although the canopy in the 30-70 ft zone was denser, it was open branched and did not have the density needed to support nesting that I have observed at 30+ nest sites in San Bernardino, Riverside and Orange County. Nowhere were there clumps of dense shrubs. There was not surface flow or moist soil during the breeding season except for periodic runoff from the adjacent development on heavy watering days. It was not adequate quantity or quality to support an aquatic invertebrate fauna.

Suitability for Arroyo Toad

The habitat was not suitable for arroyo toad. The gradient was roughly 3% with a predominately boulder/cobble bottom. The only sand was right in the bottom of the stream between the boulders and cobbles, and there are no sandy banks or terraces suitable for burrowing. The banks were steep with firm (non-sandy) soil and generally 90-100% covered with non-native periwinkle. The upland was either dense periwinkle or developed with little potential habitat. There is no reliable flow in the stream during the breeding season and no pools suitable for breeding.

Suitability for Western Pond Turtle

The habitat was not suitable for western pond turtle. There is no permanent water. Even when there is temporary water, there are no pools. There are no banks suitable for resting or basking due to the steep sided channel all the way to the scoured channel.

Suitability for Coast Range Newt

The habitat is not suitable for Coast Range newts. There are not reliable flows in Aliso Creek through the property, even in the winter and spring. The stream is too intermittent to provide for breeding and has a lack of adequate pooling due to the gradient and narrow incised channel. The fact that the banks are so steep and fully occupied by development and non-native periwinkle further reduce the potential for occupancy by newts.

Appendix A
Species Accounts
(Drawn from the Southern California Forest Plan revision process,
2004)

Least Bell's Vireo (*Vireo bellii pusillus*)

Management Status

TNC Heritage Status Rank: G5 T2 S2

Federal: Endangered 51 FR 16483, 3/2/86. Critical habitat designated 2/2/94.

State: Endangered

General Distribution

Least Bell's vireo was historically widespread in riparian woodlands of the Central Valley and low-elevation riverine valleys of California and northern Baja California. Grinnell and Miller (1944) considered it one of the most abundant birds in California. Its historical breeding range extended from the interior of northern California to northwestern Baja California. Populations in Owens Valley, Death Valley, Sacramento and San Joaquin Valleys, the Sierra Nevada foothills, and Tehama County have been extirpated (USDI Fish and Wildlife Service 1998). Further, vast portions of these areas are no longer available for recolonization or expansion because of habitat destruction (USDI Fish and Wildlife Service 1998).

Over 95 percent of historic riparian habitat has been lost throughout its former range in the central valley of California which may have accounted for 60-80 percent of the original population (USDI FWS 1986). Similar habitat losses have occurred throughout the remaining stronghold in southern California (USDI FWS 1986). Despite increases in population numbers since 1986, the least Bell's vireo still occupies a very small fraction of its former range (Goldwasser and Wilbur 1980, USDI Fish and Wildlife Service 2001). The species' breeding distribution is currently restricted to eight California counties: Kern, San Diego, San Bernardino, Riverside, Ventura, Los Angeles, Santa Barbara, and Imperial. Designated critical habitat occurs in six of these counties (USDI Fish and Wildlife Service 1998). Breeding populations are concentrated in San Diego, Santa Barbara, and Riverside Counties. The northern limit of breeding populations is the Santa Ynez River in Santa Barbara County (USDA Forest Service 2000). Least Bell's vireos winter in southern Baja California, Mexico.

Habitat Requirements

Least Bell's vireo is an obligate low-elevation riparian species during the breeding season. It inhabits dense, low-elevation, willow-dominated riparian habitats with lush understory vegetation in the immediate vicinity of watercourses.

The most important structural habitat characteristic for least Bell's vireos is a dense shrub understory approximately 2–10 feet (0.6–3.0 meters) above ground (Goldwasser 1981, Franzreb 1989). According to the USDI Fish and Wildlife Service (2001), the habitat elements essential for conservation of the taxon can be described as riparian woodland

vegetation that generally contains both canopy and shrub layers and includes some associated upland habitats. Examples of suitable breeding habitat are broad cottonwood-willow woodlands with a dense shrubby understory and mule fat scrub. Most areas that support least Bell's vireo populations are in early stages of succession where most woody vegetation is 5–10 years old (Franzreb 1989, Gray and Greaves 1984).

Least Bell's vireos nest primarily in willows but also use a variety of shrubs, trees, and vines (USDI Fish and Wildlife Service 1986). Nests are generally located in the fork of a forb, shrub, or tree within 3 feet (1 meter) of the ground. These areas generally have an open midstory with an overstory consisting of willows (*Salix* spp.), cottonwoods (*Populus* spp.), sycamores (*Platanus* spp.) or oaks (*Quercus* spp.). Significant overstory species include mature arroyo willow (*S. lasiolepis*) and black willows (*S. goodingii*). Occasional cottonwoods and western sycamore (*P. racemosa*) occur in some least Bell's vireo habitats. Coast live oak (*Q. agrifolia*) may also comprise some of the overstory (USDI Fish and Wildlife Service 2000). Canopy cover is generally greater than 50% with occasional small openings. The understory frequently contains dense subshrub or shrub thickets. These thickets are often dominated by sandbar willow (*S. hindsiana*), mule fat (*Baccharis salicifolia*), young individuals of other willow species such as arroyo or black willows, and one or more herbaceous species. Although extensive riparian areas with heavy undergrowth provide important habitat for least Bell's vireos, large areas are not required for successful breeding (Gray and Greaves 1984). The birds' center of activity is typically in understory vegetation, and their nest sites and song perches are seldom higher than 6 feet (1.8 meters) above ground (Goldwasser 1978). Least Bell's vireos forage in riparian and adjacent upland habitats (USDI Fish and Wildlife Service 1986).

Least Bell's vireos are usually found at elevations below 2,000 feet (610 meters) (California Natural Diversity Database 1998), although individuals have been reported up to 4,200 feet (1,280 meters), primarily in desert areas. Populations on the coastal slope that are breeding successfully are all below 2,500 feet (762 meters). Of 123 occurrences reported in the California Natural Diversity Database, 87% are at 2,000 feet (610 meters) or less, and 95% are at 3,000 feet (914 meters) or less (California Natural Diversity Database 1998).

Based on the results of studies conducted on the Cleveland National Forest (Wells 1990), least Bell's vireos occur on the Cleveland in drainages with low-to-medium shrub cover of arroyo willow (*Salix lasiolepis* var. *lasiolepis*) and mule fat (*Baccharis glutinosa*) and a moderately dense overstory. Least Bell's vireos also occur to a lesser degree in drainages with low-to-medium shrub cover with little or no overstory. The vegetative composition of these areas is consistent with least Bell's vireo nesting habitat parameters described for coastal areas by Goldwasser (1981) and Salata (1983), who reported that dense shrub cover with a high degree of understory development is the primary nesting habitat requirement for least Bell's vireo.

On its wintering grounds in Baja California, least Bell's vireo occurs primarily in mesquite scrub vegetation in arroyos (USDI Fish and Wildlife Service 1998).

Literature

- American Ornithologists' Union. 1957. *Checklist of North American birds*. Fifth edition. Washington, DC: American Ornithologists' Union.
- Barlow, J. C. 1962. Natural history of the Bell's vireo, *Vireo bellii* Audubon. University of Kansas Publication 12:241–296.
- Brown, B. T. 1993. Bell's vireo. In A. Poole, P. Stettenheim, and F. Gill (eds.), *The birds of North America*, No. 35. Philadelphia, PA: the Academy of Natural Sciences and Washington, DC: the American Ornithologists' Union.
- California Natural Diversity Database. 1998. RareFind 2. Version 2.0.8. Sacramento, CA: California Department of Fish and Game.
- Chapin, E. A. 1925. Food habits of the vireos. Bulletin 1355. Washington, DC: U.S. Department of Agriculture.
- Cink, C. L. 1977. Snake predation on Bell's vireo nestlings. *Wilson Bulletin* 89:349–350.
- Collins, C. T., L. R. Hays, M. Wheeler, and D. Willick. 1989. The status and management of the least Bell's vireo within the Prado Basin, California, during 1989. Final Report to Orange County Water District, Fountain Valley, CA.
- Finch, D. M., S. H. Stoleson, eds. 2000. Status, Ecology, and conservation of the southwestern willow flycatcher. Gen. Tech. Rep. RMRS-GTR-60. USDA Forest Service. 131 p.
- Franzreb, K. E. 1987. Endangered status and strategies for conservation of the least Bell's vireo (*Vireo bellii pusillus*) in California. *Western Birds* 18:43–49.
- Franzreb, K. E. 1989. Ecology and conservation of the endangered least Bell's vireo. Biological Report 89. Washington, DC: USDI Fish and Wildlife Service.
- Goldwasser, S. 1978. Distribution, reproductive success, and impact of nest parasitism by brown-headed cowbirds on least Bell's vireos. Final Report. (Job IV11.5.1). Sacramento, CA: California Department of Fish and Game, Wildlife Management Branch, Nongame Wildlife Investigations.
- _____. 1981. Habitat requirements of the least Bell's vireo. California Department of Fish and Game, Job IV-38.1, Final Report.
- Goldwasser, S., and S. Wilbur. 1980. The least Bell's vireo in California: a defacto endangered race. *American Birds* 34:742–745.
- Gray, M. V., and J. M. Greaves. 1981. The riparian forest habitat for the least Bell's vireo (*Vireo bellii pusillus*). Paper presented at the California Riparian Systems Conference, September 1981. University of California, Davis.
- _____. 1984. Riparian forest as habitat for the least Bell's vireo. In R. E. Warner and K. M. Hendrix (eds.) *California Riparian Systems*. Berkeley, CA: University of California Press.
- _____. 1987. Nest-site tenacity of least Bell's vireos. *Western Birds* 18:50–54.
- _____. 1989. Maintaining site integrity for breeding least Bell's vireos. In Proceedings of the California Riparian Systems Conference, September 1988. Davis, CA: USDA Forest Service, General Technical Report PSW-110: 293–298.
- _____. 1993. Bell's vireo and cowbird management, Gibraltar Reservoir area 1993. Prepared for USDA Forest Service, California Department of Fish and

- Game, and USDI Fish and Wildlife Service. Unpublished report on file at the Los Padres National Forest, Goleta, CA.
- _____. 1997. Least Bell's vireo survival and recovery. *Flight Log: Newsletter of California Partners in Flight*. 1997(5):6.
- Greaves, J. M., and M. V. Gray. 1991. The least Bell's vireo population in the Gibraltar Reservoir area during 1991. Final Report to Los Padres National Forest, Goleta, CA.
- Greaves, J. M., and Z. Labinger. 1997. Site tenacity and dispersal of least Bell's vireos. *Transactions of the Western Section of the Wildlife Society* 33:18–23.
- Grinnell, J., and A. H. Miller. 1944. *The distribution of the birds of California*. Berkeley, CA: L. Casper Ornithological Club.
- Jones, B. 1985. Status of the least Bell's vireo on the Cleveland National Forest, Descanso and Palomar Ranger Districts. Spring Valley, CA: Sweetwater Environmental Biologists.
- Joslin, G. and H. Youmans, coordinators. 1999. Effects of recreation on Rocky Mountain wildlife: A review for Montana. Committee of effects of recreation on wildlife, Montana Chapter of The Wildlife Society. 307 p.
- Klimkiewicz, M. K., R. B. Clapp, and A. G. Fitch. 1983. Longevity records of North American birds: Remizidae through Parulinae. *Journal of Field Ornithology* 54:287–294.
- Kus, B. E., and K. L. Miner. 1987. Foraging behavior of the least Bell's vireo: use of riparian and non-riparian habitats. Unpublished report. San Diego State University, CA.
- Kus, B., D. Evans, B. Langan, and M. B. Mulrooney. In prep. Status and distribution of the least Bell's vireo and southwestern willow flycatcher at the Cleveland National Forest in 2002. USGS-Western Ecological Research Center. Final Report for Cleveland National Forest.
- Nolan, V. 1960. Breeding behavior of the Bell's vireo in southern Indiana. *Condor* 62:225–244.
- RECON (Regional Environmental Consultants). 1989. Draft environmental impact report/environmental impact statement: adoption and implementation of Stephen's kangaroo rat interim habitat conservation plan and Endangered Species Act Section 10a permit. Prepared for Riverside County Planning Department.
- Rosenberg, K. R., R. D. Ohmart, W. C. Hunter, and B. W. Anderson. 1991. *Birds of the Lower Colorado River valley*. Tucson, AZ: University of Arizona Press.
- Salata, L. 1983. Status of the least Bell's vireo on Camp Pendleton, California. Unpublished report. Laguna Niguel, CA: USDI Fish and Wildlife Service.
- Stephenson, J. R., and G. M. Calcarone. 1999. Southern California mountains and foothills assessment: habitat and species conservation issues. General Technical Report GTR-PSW-172. Albany, CA: Pacific Southwest Research Station, USDA Forest Service.
- USDI Fish and Wildlife Service. 1986. Endangered and threatened wildlife and plants: determination of endangered status for the least Bell's vireo. 51 Federal Register 16483, March 2, 1986.
- _____. 1998. Draft recovery plan for the least Bell's vireo (*Vireo bellii pusillus*). Portland, OR: USDI Fish and Wildlife Service.

- _____. 2000. Biological opinion on the effects of ongoing forest activities that may affect listed riparian species on the Cleveland National Forest, the Los Padres National Forest, the San Bernardino National Forest and Angeles National Forest in Southern California (1-6-99-F-21)
- _____. 2001. Biological and conference opinions on the continued implementation of land and resource management plans for the four southern California National Forests, as modified by new interim management direction and conservation measures (1-6-00-F-773.2)
- USDA Forest Service. 2000. Southern California conservation strategy province consultation package. December 15. Unpublished document submitted to the USDI Fish and Wildlife Service.
- Wells, J. 1990. Population status of the least Bell's vireo on the Cleveland National Forest, Descanso Ranger District. Unpublished Report. USDA Forest Service, Cleveland National Forest.
- Wells, J., and J. Turnbull. 1998. 1997 sensitive species survey results for Pine Creek and Hauser Canyon Wilderness Areas, Cleveland National Forest. Unpublished report.
- _____. 2000. 1999 sensitive species survey results for Pine Creek and Hauser Canyon Wilderness Areas, Cleveland National Forest. Unpublished report.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

Management Status

TNC Heritage Status Rank: G5T1T2S1

Federal: Endangered; critical habitat designated on July 2, 1997 (62 Federal Register 39129);

State: Endangered

General Distribution

Southwestern willow flycatcher's historical breeding range included southern California, Arizona, New Mexico, western Texas, southwestern Colorado, southern Utah, southern Nevada, and northern portions of Sonora and Baja California (Unitt 1987). This subspecies is currently known to nest at only about 75 riparian sites in the southwestern United States. The current breeding range includes southern California, extreme southern Nevada, Arizona, New Mexico, and western Texas (Hubbard 1987, Unitt 1987, Browning 1993, McKernan and Braden 1998, Sedgwick 2000). This subspecies may also breed in southwestern Colorado, but recent documented nesting records are lacking (USDI Fish and Wildlife Service 1995). Few nesting records of this subspecies have been recorded from northwestern Baja California (Unitt 1987, Howell and Webb 1995).

Natural History

Habitat Requirements

Southwestern willow flycatcher is a riparian obligate during the breeding season. This species occurs primarily in densely vegetated riparian habitats, preferring streamside associations of cottonwood (*Populus* spp.), willow (*Salix* spp.), alder (*Alnus* spp.), and other riparian vegetation (Unitt 1987). Southwestern willow flycatcher also occurs in woodland edges, meadows, and brushy fields, though nesting birds are typically restricted to willow thickets in riparian areas (Sogge et al. 1997a, 1997b).

There is considerable variation in patch size, patch shape and configuration, and plant species composition among southwestern willow flycatcher breeding sites (Sogge and Marshall 2000). However, three factors are consistently characteristic of willow flycatcher breeding habitat: patches of dense riparian vegetation with complex understory structure, the presence of standing or slow-moving water, and gaps or open foraging areas (Sogge and Marshall 2000, Jones & Stokes 2001). Sogge et al. (1997a) defined suitable habitat as riparian areas more than 10 meters (30 feet) wide with dense vegetation, occasional openings, and open water. Tibbits et al. (1994) described suitable habitat as including dense riparian vegetation and surface water or soils that are saturated during the midsummer breeding season. Tibbits et al. (1994) noted that southwestern willow flycatchers typically do not breed in riparian habitat along high-gradient streams. Also, cottonwood-willow gallery forests that lack understory structure are not suitable breeding habitat (Sogge and Marshall 2000).

Insufficient data exist to estimate the minimum patch size or the total amount of habitat within an area required to support nesting southwestern willow flycatchers, including defended space (Jones & Stokes 2001). The available information indicates that habitat patches as small as 1.2 acres (0.5 hectares) can support one or two nesting pairs (Sogge unpublished data, USDI Fish and Wildlife Service 1995). Sogge et al. (1993) found territorial flycatchers in tamarisk-dominated habitat patches of 1.2–3.0 acres (0.5–1.2 hectares). Two habitat patches of 1.2 and 2.2 acres (0.5 and 0.9 hectare) each supported two territories (Muiznieks et al. 1994). On the South Fork of the Kern River, southwestern willow flycatchers usually nest in groups (Whitfield pers. comm., Jones & Stokes 2001); their nests may be within about 66 feet (20 meters) of each other (Jones & Stokes 2001). These observations indicate that multiple nesting pairs overlap in their use of foraging areas and appear to defend relatively small territories around their riparian nest sites (see *Territoriality/Home Range* below)

Literature

- American Ornithologists' Union. 1998. *Checklist of North American birds* (seventh edition). Lawrence, KS: Allen Press.
- Baichich, P., and C. Harrison. 1997. *Guide to nests, eggs, and nestlings of North American birds*. New York: Academic Press.
- Bent, A. C. 1942. Life histories of North American flycatchers, larks, swallows, and their allies. (Smithsonian Institution U.S. National Museum Bulletin No. 176.) Washington, DC: U.S. Government Printing Office.

- Blakesley, J. A., and K. P. Reese. 1988. Avian use of campground and noncampground sites in riparian zones. *Journal of Wildlife Management* 52:399–402.
- Brown, B. T. 1988. Breeding ecology of a willow flycatcher population in Grand Canyon, AZ. *Western Birds* 24:241–257.
- Browning, M. R. 1993. Comments on the taxonomy of *Empidonax traillii* (willow flycatcher). *Western Birds* 19:25–33.
- Dudek and Associates. 2000. Comprehensive species list. In: Understanding the plants and animals of the western Riverside County Multiple Species Habitat Conservation Plan. Available: <<http://ecoregion.ucr.edu/mshcp/index.html>>.
- Garrett, K., and J. Dunn. 1981. *Birds of southern California: status and distribution*. Los Angeles, CA: Los Angeles Audubon Society.
- Goodman, D. 1987. The demography of chance extinction. Pages 11–34 in M. E. Soulé (ed.), *Viable populations for conservation*. Cambridge, UK: Cambridge University Press.
- Griffith, J. T., and J. C. Griffith. 1995. The status of the southwestern willow flycatcher at the upper San Luis Rey River, San Diego County, California, in 1994. Unpublished report to USDA Forest Service, Palomar Ranger District.
- Grinnell, J., and A. H. Miller. 1944. *The distribution of the birds of California*. Berkeley, CA: L. Casper Ornithological Club.
- Hanski, I., and M. E. Gilpin (eds.). 1997. *Metapopulation biology: ecology, genetics, and evolution*. San Diego, CA: Academic Press.
- Harris, J. H. 1991. Effects of brood parasitism by brown-headed cowbirds on willow flycatcher nesting success along the Kern River, California. *Western Birds* 22:13–26.
- Harris, J. H., S. D. Sanders, and M. A. Flett. 1987. Willow flycatcher surveys in the Sierra Nevada. *Western Birds* 18:27–36.
- Harris, J. H., S. D. Sanders, and M. A. Flett. 1988. The status and distribution of the willow flycatcher (*Empidonax traillii*) in the Sierra Nevada. Administrative Report 88-1. Sacramento, CA: California Department of Fish and Game, Wildlife Management Branch.
- Howell, S. N. G., and S. Webb. 1995. *A guide to the birds of Mexico and northern Central America*. New York: Oxford University Press.
- Hubbard, J. P. 1987. The status of the willow flycatcher in New Mexico. New Mexico Department of Game and Fish, Endangered Species Program, Santa Fe.
- Jones & Stokes. 2001. Biological studies in support of Endangered Species Act compliance for routine operation of Isabella Dam and Reservoir, California. Task 3. Final habitat suitability index model for the southwestern willow flycatcher population in the Kern River Valley. Prepared for U.S. Army Corps of Engineers, Sacramento District, Sacramento, CA. Environmental Services Contract DACW05-95-D-0003.
- Kings River Conservation District. 1985. Studies on the willow flycatcher in the central Sierra Nevada conducted during 1983 and 1984. Kings River Conservation District Res. Rep. No. 85-017.
- Lebreton, J. D., K. P. Burnham, J. Clobert, and D. R. Anderson. 1992. Modeling survival and testing biological hypotheses using marked animals: a unified approach with case studies. *Ecological Monographs* 62:611–8.

- Marshall, R. M. 2000. Population status on breeding grounds. Chapter 2 in D. M. Finch and S. H. Stoleson (eds.), *Status, ecology, and conservation of the southwestern willow flycatcher*. USDA Forest Service General Technical Report RMRS-GTR-60.
- Marshall, R. M., and S. H. Stoleson. 2000. Threats. Chapter 3 in D. M. Finch and S. H. Stoleson (eds.), *Status, ecology, and conservation of the southwestern willow flycatcher*. USDA Forest Service General Technical Report RMRS-GTR-60.
- Maynard, W. R. 1995. Summary of 1994 survey efforts in New Mexico for southwestern willow flycatcher (*Empidonax traillii extimus*). Contract No. 94-516-69. New Mexico Department of Game and Fish, Santa Fe.
- McCabe, R. A. 1991. *The little green bird: ecology of the willow flycatcher*. Amherst, WI: Palmer Publications.
- McKernan, R. L., and G. Braden. 1998. Status, distribution, and habitat affinities of the southwestern willow flycatcher along the lower Colorado River Year 2 – 1997. U.S. Bureau of Reclamation, Lower Colorado River Region, Boulder City, NV, and USDI Fish and Wildlife Service, Carlsbad Field Office, Carlsbad, CA.
- Muiznieks, B. D., T. E. Corman, S. J. Sferra, M. K. Sogge, and T. J. Tibbits. 1994. Arizona Partners in Flight 1993 southwestern willow flycatcher survey. (Technical Report 52.) Phoenix, AZ: Arizona Game and Fish Department, Nongame and Endangered Wildlife Program.
- Noon, B. R., and J. R. Sauer. 1992. Population models for passerine birds: structure, parameterization, and analysis. Pages 441–464 in D. R. McCullough and R. H. Barrett (eds.), *Wildlife 2001: Populations*. London: Elsevier Applied Science.
- Paradzick, C. E., R. F. Davidson, J. W. Rourke, M. W. Sumner, A. M. Wartell, and T. T. McCarthy. 2000. Southwestern willow flycatcher 1999 survey and nest monitoring report. Technical Report 151. Phoenix, AZ: Arizona Game and Fish Department, Nongame and Endangered Wildlife Program.
- Paxton, E., S. Langridge, and M. K. Sogge. 1997. Banding and population genetics of southwestern willow flycatchers in Arizona: 1997 summary report. USGS Biological Resources Division, Colorado Plateau Field Station, Northern Arizona University, Flagstaff.
- Phillips, A. R. 1948. Geographic variation in *Empidonax traillii*. *Auk* 65:507–514.
- Remsen, J. V., Jr. 1978. Bird species of special concern in California. Administrative Report No. 78-1. Sacramento, CA: California Department of Fish and Game, Wildlife Management Branch.
- Ridgely, R. S. 1981. *Guide to the birds of Panama*. Princeton, NJ: Princeton University Press.
- Ridgely, R. S., and G. Tudor. 1994. *The birds of South America: suboscine passerines*. Austin, TX: University of Texas Press.
- Sanders, S. D., and M. A. Flett. 1989. Ecology of a Sierra Nevada population of willow flycatchers (*Empidonax traillii*), 1986–1987. Sacramento, CA: California Department of Fish and Game, Nongame Bird and Mammal Section.
- Sedgwick, J. A. 2000. Willow flycatcher (*Empidonax traillii*). In A. Poole and F. Gill (eds.), *The birds of North America*, No. 533. Philadelphia, PA: the Academy of Natural Sciences and Washington, DC: the American Ornithologists' Union.

- Sferra, S. J., R. A. Meyer, and T. E. Corman. 1995. Arizona partners in flight: 1994 southwestern willow flycatcher survey. Final Technical Report 69. Phoenix, AZ: Arizona Game and Fish Department, Nongame and Endangered Wildlife Program.
- Sferra, S. J., T. E. Corman, C. E. Paradzick, J. W. Rourke, J. A. Spencer, and M. W. Sumner. 1997. Arizona partners in flight: southwestern willow flycatcher survey. 1993–1996 summary report. Technical Report 113. Phoenix, AZ: Arizona Game and Fish Department, Nongame and Endangered Wildlife Program.
- Skaggs, R. W. 1996. Population size, breeding biology, and habitat of willow flycatchers in the Cliff-Gila Valley, New Mexico, 1995. Final Report. New Mexico Department of Game and Fish.
- Small, A. 1994. *California birds, their status and distribution*. Vista, CA: Ibis Publishing Company.
- Sogge, M. K. 1995. Southwestern willow flycatcher (*Empidonax traillii extimus*) monitoring at Tuzigoot National Monument. 1995 progress report to the National Park Service. National Biological Service Colorado Plateau Research Station/Northern Arizona University Report.
- _____. 2000. Breeding season ecology. In D. M. Finch and S. H. Stoleson (eds.), *Status, ecology, and conservation of the southwestern willow flycatcher*. USDA Forest Service General Technical Report RMRS-GTR-60.
- Sogge, M. K., and R. M. Marshall. 2000. A survey of current breeding habitats. In D. M. Finch and S. H. Stoleson (eds.), *Status, ecology, and conservation of the southwestern willow flycatcher*. USDA Forest Service General Technical Report RMRS-GTR-60.
- Sogge, M. K., T. J. Tibbits, and S. J. Sferra. 1993. Status of the southwestern willow flycatcher along the Colorado River between Glen Canyon Dam and Lake Mead – 1993. Summary Report. Flagstaff, AZ: National Park Service Cooperative Studies Unit/Northern Arizona University/USDI Fish and Wildlife Service and Arizona Game and Fish Department.
- Sogge, M. K., R. M. Marshall, S. J. Sferra, and T. J. Tibbits. 1997a. A southwestern willow flycatcher natural history summary and survey protocol. U.S. Department of the Interior, National Park Service Technical Report NPS/NAUCPRS/NRTR-97/12. Flagstaff, AZ: Colorado Plateau Research Station at Northern Arizona University.
- Sogge, M. K., T. J. Tibbits, and J. R. Petterson. 1997b. Status and breeding ecology of the southwestern willow flycatcher in the Grand Canyon. *Western birds* 28:142–157.
- Soulé, M. E. (ed). 1987. *Viable populations for conservation*. Cambridge, UK: Cambridge University Press.
- Stephenson, J. R., and G. M. Calcarone. 1999. Southern California mountains and foothills assessment: habitat and species conservation issues. General Technical Report GTR-PSW-172. Albany, CA: Pacific Southwest Research Station, USDA Forest Service.
- Stoleson, S. H., M. J. Whitfield, and M. K. Sogge. 2000. Demographic characteristics and population modeling. Chapter 8 in D. M. Finch and S. H. Stoleson (eds.), *Status, ecology, and conservation of the southwestern willow flycatcher*. USDA Forest Service General Technical Report RMRS-GTR-60.

- Tibbitts, T. J., M. K. Sogge, and S. J. Sferra. 1994. A survey protocol for the southwestern willow flycatcher (*Empidonax traillii extimus*). National Park Service Technical Report NPS/NAUCPRS/NRTR-94/04.
- Unitt, P. 1987. *Empidonax traillii extimus*: an endangered subspecies. *Western Birds* 18:137–162.
- USDA Forest Service. 2000. Southern California conservation strategy province consultation package. Unpublished document submitted to the USDI Fish and Wildlife Service. December 15, 2000.
- USDI Fish and Wildlife Service. 1995. Endangered and threatened wildlife and plants; final rule determining endangered status for the southwestern willow flycatcher. 60 Federal Register 10694–10715.
- _____. 2000. Biological opinion on the effects of ongoing forest activities that may affect listed riparian species on the Cleveland National Forest, the Los Padres National Forest, the San Bernardino National Forest and Angeles National Forest in Southern California (1-6-99-F-21).
- USDI Fish and Wildlife Service. 2001a. Biological and conference opinions on the continued implementation of land and resource management plans for the four southern California National Forests, as modified by new interim management direction and conservation measures (1-6-00-F-773.2)
- USDI Fish and Wildlife Service. 2001b. Draft Southwestern Willow Flycatcher Recovery Plan. Albuquerque, New Mexico. Walkinshaw, L. H. 1966. Summer biology of Traill's flycatcher. *Wilson Bulletin* 78:31–46.
- Wheelock, I. G. 1912. *Birds of California: An introduction to more than three hundred common birds of the state and adjacent lands*. Chicago: A. C. McClurg and Company.
- Whitfield, M. J. 1990. Willow flycatcher reproductive response to brown-headed cowbird parasitism. M.S. thesis, California State University, Chico.
- _____. 1994. A brown-headed cowbird control program and monitoring for willow flycatchers, South Fork, California. Prepared for the California Department of Fish and Game, Kern River Research Center, Weldon, CA.
- Whitfield, M. J., and K. M. Enos. 1996. A brown-headed cowbird control program and monitoring for the southwestern willow flycatcher, South Fork Kern River, California, 1996. Final report to the U.S. Army Corps of Engineers Sacramento District.
- _____. 1998. Reproductive response of the southwestern willow flycatcher (*Empidonax traillii extimus*) to the removal of brown-headed cowbirds in 1998. Draft report prepared for the U.S. Army Corps of Engineers Sacramento District (Purchase order DACW05-98-P-0459), Sacramento, CA, and California Department of Fish and Game, Bird and Mammal Conservation Program (DFG Contract No. FG6151WM). Sacramento, CA.
- Whitfield, M. J., and C. M. Strong. 1995. A brown-headed cowbird control program and monitoring program for the southwestern willow flycatcher, South Fork, California. Report 95-4. Prepared for California Department of Fish and Game, Bird and Mammal Conservation Program, Sacramento, CA.
- Whitfield, M. J., K. M. Enos, and S. P. Rowe. 1997. Reproductive response of the southwestern willow flycatcher (*Empidonax traillii extimus*) to the removal of brown-

headed cowbirds, South Fork Kern River, California, 1997. Draft report prepared for the U.S. Army Corps of Engineers Sacramento District (Purchase order DACW05-97-P-0670), Sacramento, CA, and California Department of Fish and Game, Bird and Mammal Conservation Program (DFG Contract No. FG6151WM), Sacramento, CA.

_____. 1999a. Is brown-headed cowbird trapping effective for managing populations of the endangered southwestern willow flycatcher? *Studies in Avian Biology* 18:260–266.

_____. 1999b. Reproductive response of the southwestern willow flycatcher (*Empidonax traillii extimus*) to the removal of brown-headed cowbirds, South Fork Kern River, California, 1997. Draft report prepared for the U.S. Army Corps of Engineers Sacramento District (Purchase order DACW05-97-P-0670), Sacramento, CA, and California Department of Fish and Game, Bird and Mammal Conservation Program (DFG Contract No. FG6151WM), Sacramento, CA.

Personal Communications

Whitfield, M. J. Researcher. Kern River Research Center, Weldon, CA. 1996 and 1997 – meetings and telephone conversations.

Arroyo Toad (*Bufo californicus*)

Management Status

Heritage Status Rank: G2G3T2T3S2S3

Federal: Endangered (59 Federal Register [FR] 64859); critical habitat designated February 7, 2001

State: None

Other: California Department of Fish and Game Species of Special Concern

General Distribution

Arroyo toad historically occurred from the upper Salinas River system in Monterey County to the vicinity of San Quintin, Baja California; it was found in at least 22 river basins in southern California. The species has been extirpated from approximately 75% of its former range in the United States (USDI Fish and Wildlife Service 1999).

The current distribution of arroyo toad in the United States is from the San Antonio River in Monterey County south to the Tijuana River and Cottonwood Creek Basin along the Mexican border. Although arroyo toad occurs mostly along coastal drainages, it has also been recorded at several locations on the desert slopes of the Transverse Ranges (Jennings and Hayes 1994).

Habitat Requirements

Arroyo toad is endemic to the coastal plains, mountains, and desert slopes of central and southern California and northwestern Baja California from near sea level to about 8,000 feet (2,400 meters). Within these areas, arroyo toad is found in both perennial and

intermittent rivers and streams with shallow, sandy to gravelly pools adjacent to sand or fine gravel terraces. Arroyo toad has evolved in a system that is inherently dynamic, with marked seasonal and annual fluctuations in rainfall and flooding. Breeding habitat requirements are highly specialized. Specifically, arroyo toads require shallow slow-moving stream and riparian habitats that are naturally disturbed on a regular basis, primarily by flooding (USDI Fish and Wildlife Service 2000).

Designated critical habitat for arroyo toad encompasses 182,350 acres (73,795 hectares) in 22 separate units from Monterey to San Diego Counties (66 FR 9414). The following is a summary of the physical and biological features (primary constituent elements) that are essential to the conservation of the species:

Streams with hydrologic regime that supplies sufficient flowing water of suitable quality and quantity and at the appropriate times to provide space, food, and cover needed to sustain eggs, tadpoles, juveniles, and adult breeding toads;

Low-gradient stream segments with sandy or fine gravel substrates that support formation of shallow pools with sparsely vegetated sand and gravel bars for breeding and rearing of tadpoles and juveniles;

A natural flooding regime that periodically scours riparian vegetation, reworks stream channels and terraces, and redistributes sands such that adequate breeding pools and sufficient terrace habitats are maintained;

Upland habitats of sufficient width, substrate, and vegetative cover to provide foraging and living areas for subadult and adult arroyo toads;

Few or no nonnative species that prey upon or compete with arroyo toads or degrade their habitats; and

Stream channels and upland habitats where human-made barriers do not substantially impede migration to overwintering sites, dispersal between populations, or recolonization of areas that contain suitable habitat (66 FR 9414).

Literature

- Gergus, E. W. A. 1998. Systematics of the *Bufo microscaphus* complex: allozyme evidence. *Herpetologica* 54(3):317-325.
- Jennings, M. R., and M. P. Hayes. 1994. Amphibian and reptile species of special concern in California. Final report to the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, CA, under contract 8023.
- Ramirez, Ruben. 2002. Arroyo toad radio telemetry habitat usage study at Little Rock Creek, Angeles N. F. Unpubl. final report.
- Stephenson, J. R., and G. M. Calcarone. 1999. Southern California mountains and foothills assessment: habitat and species conservation issues. General Technical Report PSW-GTR-172. Albany, CA: Pacific Southwest Research Station, USDA Forest Service.

- Sweet, S. S. 1992. Initial report on the ecology and status of the arroyo toad (*Bufo microscaphus californicus*) on the Los Padres National Forest of Southern California with management recommendations. Contract report to Los Padres National Forest.
- _____. 1993. Second report on the biology and status of the arroyo toad (*Bufo microscaphus californicus*) on the Los Padres National Forest of southern California. Contract report to Los Padres National Forest.
- USDI Fish and Wildlife Service. 1999. Final recovery plan for the arroyo toad (*Bufo microscaphus californicus*). Portland, OR.
- USDI Fish and Wildlife Service. 2000. Biological opinion on the effects of ongoing forest activities that may affect listed riparian species on the Cleveland National Forest, the Los Padres National Forest, the San Bernardino National Forest and Angeles National Forest in southern California (1-6-99-F-21).
- USDI Fish and Wildlife Service. 2001. Final Designation of Critical Habitat for the Arroyo Toad, Final Rule. Fed. Reg. Vol. 66, No. 26.
- Personal Communications
- Anderson, S. Southern California National Forest province biologist. 2002. Comment submitted to the USDA Forest Service Southern Province Forest Plan Revision species information peer review web site.
- Hyde-Sato, Debby. Species Viability Analysis Specialist. Cleveland National Forest. April 2002 – Telephone conversation.
- Freel, Maeton. Los Padres National Forest Biologist. 2002. Comment submitted to the USDA Forest Service Southern Province Forest Plan Revision species information peer review web site.
- Loe, S. San Bernardino National Forest Biologist. 2002. Comment submitted to the USDA Forest Service Southern Province Forest Plan Revision species information peer review web site.

Southwestern Pond Turtle (*Clemmys marmorata pallida*)

Management Status

Heritage Status Rank: G3G4T2T3S2

Federal: None

State: None

Other: California Department of Fish and Game Species of Special Concern;

General Distribution

Southwestern pond turtle is found from south of San Francisco Bay to northern Baja California. This subspecies intergrades with northwestern pond turtle (*C. m. marmorata*) over a large area in central California (Bury 1970, Stebbins 1985). Historically, western pond turtle occurred throughout most of the west coast of North America, primarily west of the Cascade-Sierra crest, from western British Colombia to northern Baja California (Ernst et al. 1994). Currently, there are records of isolated populations occurring in

- Goodman, Jr., R. H. 1994. Report on the biology of the southwestern pond turtle (*Clemmys marmorata pallida*) in the Chino Hills State Park. Unpublished report. California Department of Parks and Recreation.
- Gray, E. M. 1995. DNA fingerprinting reveals a lack of genetic variation in northern populations of the western pond turtle (*Clemmys marmorata*). *Conservation biology* 9(5):1244–1255.
- Holland, D. C. 1985. Life history notes: *Clemmys marmorata*, feeding. *Herpetological Review* 16(4):112–113.
- _____. 1991. A synopsis of the ecology and status of the western pond turtle (*Clemmys marmorata*) in 1991. Unpublished report prepared for the USDI Fish and Wildlife Service.
- _____. 1994. The western pond turtle: habitat and history. Portland, OR: U.S. Department of Energy, Bonneville Power Administration.
- Janzen, F. J., S. L. Hoover, and H. B. Shaffer. 1997. Molecular phylogeny of the western pond turtle (*Clemmys marmorata*): preliminary results. *Linnaeus Fund Research Report. Chelonian conservation biology* 2:623–626.
- Jennings, M. R., M. P. Hayes, and D. C. Holland. 1992. A petition to the U.S. Fish and Wildlife Service to place the California red-legged frog and the western pond turtle on the list of endangered wildlife and plants.
- Jennings, M. R., and M. P. Hayes. 1994. Amphibian and reptile species of special concern in California. Rancho Cordova, CA: California Department of Fish and Game.
- Lovitch, J. E. 1999. Western pond turtle *Clemmys marmorata*. Department of Biology, University of California, Riverside.
- Stebbins, R. C. 1985. *A field guide to western reptiles and amphibians* (second edition). Boston, MA: Houghton Mifflin Co.
- USDI Fish and Wildlife Service. 1993. Endangered and threatened wildlife and plants; notice of a 1-year petition finding on the western pond turtle. 58 Federal Register 42717–42718.
- Zeiner, D. C., W. F. Laudenslayer Jr., and K. E. Mayer (eds.). 1988. *California's wildlife*. Volume I: *Amphibians and reptiles*. Sacramento, CA: California Statewide Wildlife Habitat Relationships System, California Department of Fish and Game.

Coast Range Newt (*Taricha torosa torosa*)

Management Status

TNC Heritage Status Rank: G5S3

Federal: None

State: None

Other: California Department of Fish and Game Species of Special Concern

General Distribution

Coast Range newt occurs in the Coast Ranges of California from central Mendocino County south to San Diego County (Stebbins 1951). Populations in southern California appear to be highly fragmented, even historically (Jennings and Hayes 1994). Adult Coast Range newts inhabit a number of terrestrial and aquatic habitats from near sea level to 6,500 feet (2,000 meters) (Petranka 1998).

Habitat Requirements

Coast Range newt is often found in areas where streams and ponds dry up in the summer. During moist conditions, this species spends a large amount of time on land beneath logs, boards, rocks, and in rodent burrows, but adults must return to water to breed (Stebbins 1951).

Populations of Coast Range newt in southern California are found in drier habitats, such as oak forests, chaparral, and rolling grasslands. Coast Range newts are commonly found in or near ditches, ponds, lakes, and streams; however, a permanent water source is not necessary (Stebbins 1951, Petranka 1998). Stream-breeding populations typically breed in slow-moving or stagnant pools in streams (Petranka 1998).

Literature

- Davis, J. R., and B. H. Brattstrom. 1975. Sounds produced by the California newt, *Taricha torosa*. *Herpetologica* 31:409–412.
- Gamradt, S. C., and L. B. Kats. 1996. The effect of introduced crayfish and mosquitofish on California newts (*Taricha torosa*). *Conservation Biology* 10:1155–1162.
- Jennings, M. R., and M. P. Hayes. 1994. Amphibian and reptile species of special concern in California. Rancho Cordova, CA: California Department of Fish and Game, Inland Fisheries Division.
- Miller, M. R., and M. E. Robbins. 1954. The reproductive cycle in *Taricha torosa* (*Triturus torosus*). *Journal of Experimental Zoology* 125:415–445.
- Mosher, H. S., Fuhrman, F. A., Buchwald, H. D., and H. G. Fischer. 1964. Tarichatoxin-tetrodotoxin: a potent neurotoxin. *Science* 144:1100–1110.
- Petranka, J. W. 1998. Salamanders of the United States and Canada. Washington and London: Smithsonian Institution and Press.
- Stebbins, R. C. 1951. Amphibians of western North America. Berkeley, CA: University of California Press.
- Stebbins, R. C. 1985. A field guide to western amphibians and reptiles (second edition). New York: Houghton Mifflin.
- Stephenson, J. R., and G. M. Calcarone. 1999. Southern California mountains and foothills assessment: habitat and species conservation issues. General Technical Report PSW-GTR-172. Albany, CA: Pacific Southwest Research Station, USDA Forest Service.
- Twitty, V. C. 1942. The species of California: *Triturus*. *Copeia* 1942:65–76.
- Personal Communication
- Wake, David. Professor of Integrative Biology and Curator of Herpetology. University of California, Berkeley. July 23, 2002. Comment submitted to the USDA Forest

Service Southern Province Forest Plan Revision species information peer review web site:

Appendix B Habitat Suitability Criteria

(Drawn from the Forest Service Forest Plan Consultation Process)

Suitable Habitat for Least Bell's Vireo

Based on 5-24-2000 Agreement between Forest Service and Fish and Wildlife Service

AN AREA WILL BE IDENTIFIED AS SUITABLE HABITAT IF IT HAS ALL FOUR OF THE FOLLOWING CHARACTERISTICS:

1. Woody riparian vegetation is present.

Field assessments for this characteristic need to meet the following criteria:

- a) This is defined by the presence of at least one shrub or tree species that is classified as an obligate or facultative wetland species (per ACOE wetlands delineation manual).
 - b) Shrubby willows or mulefat must be present at a minimum and in addition to any other woody riparian species.
- 2. Patch size is at least 0.5 acres, which can include non-riparian woody vegetation (coastal sage scrub, chaparral, or oak woodland) so long as riparian vegetation is present.**

Open grassland would not be considered suitable habitat or included in patch size.

- 3. Understory (less than 1 meter) and/or mid-story (1-4 meters) vegetation cover (shrub + herb) meets the following minimum values:**

0-1 m	--	20%
1-2 m	--	20%
2-3 m	--	15%
3-4 m	--	10%

- 4. Dense clumps of woody vegetation are present.**

Within the 0.5-acre patch, there are dense clumps of vegetation (understory, midstory, or overstory) with at least 50 to 60 percent cover.

References and unpublished reports reviewed for this process include:

Kus, Barbara E. 1998. Use of restored riparian habitat by the endangered Least Bell's Vireo. *Restoration Ecology* 6(1):75-82.

Kus, B.E. and K.L. Miner. 1989. Use of non-riparian habitats by Least Bell's Vireos. Pp. 299-303 in Abell, D.L., tech. coord., *Proceedings of the California Riparian Systems Conference*. General Technical Report PSW-110.

Steve Loe, biologist, San Bernardino National Forest, personal communication 5/24/00.

Olson, T.E. and M.V. Gray. 1989. Characteristics of Least Bell's Vireo nest sites along the Santa Ynez River. Pp. 278-284 in Abell, D.L., tech. coord., *Proceedings of the California Riparian Systems Conference*. General Technical Report PSW-110.

USDI Fish and Wildlife Service. 1998. Draft recovery plan for the least Bell's vireo (*Vireo bellii pusillus*). U.S. Fish and Wildlife Service, Portland, OR. 139 p.

Suitable Habitat for Southwest Willow Flycatcher

Based on Agreement with US Forest Service and Fish and Wildlife Service, 5-24-2000

AN AREA WILL BE IDENTIFIED AS SUITABLE HABITAT IF IT HAS ALL THREE OF THE FOLLOWING CHARACTERISTICS:

1. There is a) surface water, b) saturated soil, or c) presence of obligate/facultative herbaceous wetland plants (per the Army Corps of Engineers' wetlands delineation manual), present during the early summer months (surface water should be present at least throughout the month of May).

Field assessments for this characteristic need to meet the following criteria:

- a) Site visits need to occur between May 15th and June 30th.
- b) This characteristic is considered to be present at a site if surface water or saturated soil is detected within 200 meters of the site. Saturated soil is defined as soil that is wet or moist on its surface.
- c) Assessments conducted in years when precipitation amounts are less than 80 percent of normal may give false negative results. Therefore, during these years, if surface water or saturated soils are not observed, but the site contains the other two suitable habitat characteristics, the area will not be excluded from suitable habitat. Weather data can be obtained from the nearest available National Weather Service or Forest Service fire station.

2. Woody riparian vegetation is present and covers a minimum aerial extent of 20 percent over a 0.2 ha (0.5 ac) section of floodplain or adjacent streamside terrace.

'Woody riparian vegetation' is defined as an assemblage of shrubs and/or trees that contains at least one species which is classified as an obligate or facultative wetland species (per the Army Corps of Engineers' wetlands delineation manual).

3. Dense clumps or stands of woody vegetation are present.

This is defined by the presence of one or more clumps of woody vegetation which have the following characteristics:

- a) Clumps or stands of woody vegetation are at least 5 meters by 10 meters in size. The individual shrubs or trees in these stands are growing close enough together that some of their branches overlap or at least touch each other.
- b) Tree and/or shrub cover in these stands is 50 percent or greater.

References and unpublished reports reviewed for this process include:

Uyehara, Jamie 2000. Personal communication. Los Padres National Forest wildlife biologist and SW Willow Flycatcher / Brown headed cowbird researcher on Kern River. Now located on Los Padres NF, Goleta, CA.

Whitfield, Mary 2000. Personal communication on habitat suitability criteria developed in Arizona and New Mexico. SW Willow researcher on Kern River for past 10 years.

McKernan, Robert 2000. Personal communication on habitat criteria for SWWF based on field studies from San Bernardino mountains and Colorado River area of California/Arizona.

Draft Arroyo Toad Suitability

Based on Forest Service/Fish and Wildlife Service Workshops
February 17, 2004

Modeled breeding habitat for the Arroyo toad was based on three primary GIS parameters;

- (1) **Elevation range** of 0-4,300 feet north of the Santa Clara River and 0-5,000 feet south of the Santa Clara River;
- (2) **Stream gradient of 0-2%**
- (3) **Stream order- second order or greater streams**

Habitat assessments will be broken into two components: (1) Assessments of suitable **breeding habitat**, all located within the stream floodplain, and (2) Assessments of suitable **upland habitat** adjacent suitable breeding habitat. Priority shall be given to assessment of breeding habitat since this is the most critical factor for ensuring the continued existence of the species. *Due to the relatively large amount of field work done on the Arroyo toad, the habitat descriptions are relatively detailed and are good predictors of where toads would be found during a given field survey. However, the habitat conditions at a given site may vary over time since they can be effected by droughts, large floods and fires. In making suitable habitat determinations for jurisdictional purposes, both land managers (FS) and regulators (FWS) will be relying on local knowledge of the streams and floodplains and modeled habitat definitions.*

PRIMARY BREEDING SITE CRITERIA – An area will be identified as suitable breeding habitat if it meets the following criteria:

- (1) Stream channel **substrate primarily sand or sandy-gravel** with some open, sparsely vegetated stream banks (Sweet 1992).
- (2) The area contains **nearby sandy terraces or other elevated terraces** of similarly friable soil types; typically within 80 meters of the breeding pool (Sweet 1992).
- (3) The channel contains **low stream flows or pooled water persisting throughout at least the months of the year when toads are usually breeding** (Typically March-July) (Sweet 1992). The local breeding season may vary by elevation and in extremely wet or dry years (Ervin 2003). The

absence of adequate water in drought or below average rainfall years does not indicate the site is unsuitable in average or above average rainfall years.

SECONDARY BREEDING SITE CRITERIA – These are additional positive indicators of suitable breeding habitat but **their absence does not indicate the site being unsuitable**. The first four criteria may not be readily observable during drought years or after surface flow slows or disappears.

- (1) The presence of wet or dry **algal mats**, or evidence of pooled water, e.g. **water level stains** on rocks (Ervin 2003).
- (2) **Low in-channel current velocities (0-35 cm/sec) –(Sweet 1992)** and/or presence of still “backwater” areas which may be off the main flow channel.
- (3) **Pools usually less than 30cm deep during the egg laying- rearing season** (Sweet 1992).
- (4) **Absence of exotic predatory animals.**
- (5) **Pool site usually open to the sky-little or no over story tree cover** (Sweet 1992; Ervin 2003).

UPLAND HABITAT CRITERIA – An area may be identified as suitable upland habitat, useful for dispersal or foraging, if it:

- (1) **Does not contain any absolute barriers to toad movement** (e.g. Cliff face) from suitable breeding areas;
- (2) **Contains some level of vegetative cover or other structures** which may be used for **hiding or thermal cover** and;
- (3) Usually contains **some areas of friable soils suitable for burrowing** by toads **or contains burrows created by other wildlife.**
- (4) Is within the **lateral buffer** out to a gain of 80 feet contour above stream bed elevation.

References Cited

Ervin, Edward 2003. Personal communication at Habitat Suitability Working Group meeting, Cleveland National Forest, San Diego, CA.

Griffen, P.C., T. J. Case, and R. N. Fisher 1999. Radio telemetry study of *Bufo californicus*, arroyo toad movement patterns and habitat preferences. Contract report to California Department of Transportation-Southern Biology Pool.

Holland, D.C. and N.R. Sisk. 2001. Habitat use and population demographics of the arroyo toad (*Bufo californicus*) on MCB Camp Pendleton, San Diego County, California: Final Report for 1998-1999.(unpublished)

- Ramirez, Ruben 2002. Arroyo toad (*Bufo californicus*) radio telemetry study, Little Rock Creek, Los Angeles County, California. Final report prepared for Angeles National Forest, Arcadia, California (unpublished).
- Ramirez, Ruben 2002. Arroyo toad (*Bufo californicus*) Radio Telemetry and Pitfall Trapping Studies, Little Horsethief Canyon, Summit Valley Ranch, San Bernardino County, California. Final Report prepared for California Department of Transportation, San Bernardino, California. 92pp (unpublished).
- Sweet, Samuel 1992. Initial Report on the Ecology and Status of the Arroyo Toad (*Bufo microscaphus californicus*) on the Los Padres National Forest of Southern California with Management Recommendations. Report prepared for the Los Padres National Forest 1990-1992, Goleta, Ca.
- Uyehara, Jamie 2000. Summary of findings of pit-tagged and radio telemetered California Red-legged Frogs (*Rana aurora draytonii*) in upper Santa Ynez River, Los Padres National Forest, Santa Barbara, California (unpublished).